The effect of the location context on the EmoSensory® evaluation of yogurt products under blind, expected and informed conditions

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Objectives

Scientific studies involving the sensory evaluation mostly occurs in a controlled laboratory environment while this is not a realistic evaluation for consumers Given that this could impact the results, the question arises to which extent a real difference in testing location influences the sensory and emotional profiling of consumers.

The objective of this study was to examine the influence of brand information on the overall acceptance, sensory and emotional profiling of yogurt during two different context situations:

(i) Laboratory context (CLT);

(ii) Home-Use-Test (HUT).

Testing took place under three conditions (blind, expected and informed) with brand information.

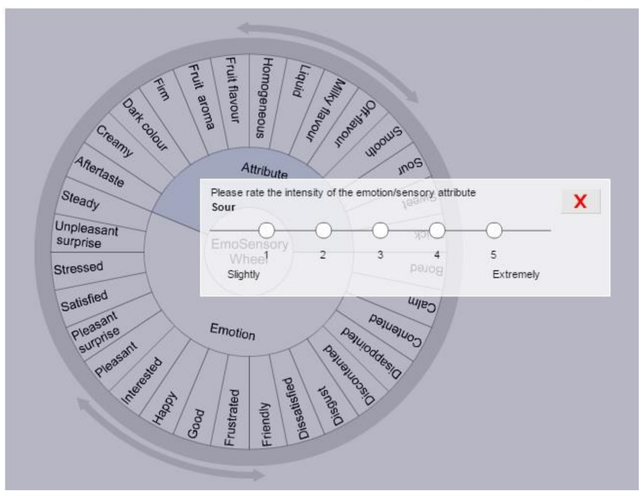
Materials & methods

PRODUCTS:

- Strawberry flavoured yogurts
- 5 samples:
  - 2 premium brands
  - 3 private label brands

Methods:

EmoSensory® Wheel (RATA scaling)



CONSUMER TEST

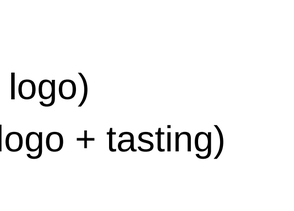
- Between-subjects design
- 3 Sessions (one session/week):
  - 1st: blind condition (tasting)
  - 2nd: expected condition (brand logo)
  - 3th: informed condition (brand logo + tasting)
- 18 emotional conceptualisations
- 14 sensory terms
- Terms generated following Schouteten et al. 2015
- EyeQuestion v3.15.10 (Logic 8BV, Netherlands)
- Samples: enough for 2-3 tablespoons

PARTICIPANTS

- 99 adults (45 male / 54 female)
- Mean age 29 years old
- 54.5% living in countryside / 45.5% in city
- Only product-users eligible
- CLT = 53, HUT = 46

STATISTICAL ANALYSIS

- IBM® SPSS 22 (USA)



Results

Effect of context

Emotional profiling

	Condition		
	Blind	Expected	Informed
Term usage			
Average percentage of emotional terms used to describe samples	CLT: 17.2 HUT: 16.9	CLT: 14.4[a] HUT: 11.0[b]	CLT:17.4[a] HUT:14.1[b]
Sample differences			
Number of emotional terms with significant differences among samples (p ≤ 0.05)	CLT – RATA: 3 CLT – RATA-S: 5 HUT - RATA: 0 HUT – RATA-S: 1	CLT - RATA: 9 CLT – RATA-S: 10 HUT - RATA: 1 HUT – RATA-S: 4	CLT - RATA: 2 CLT – RATA-S: 2 HUT - RATA: 0 HUT – RATA-S: 0

Sensory profiling

	Condition		
	Blind	Expected	Informed
Term usage			
Average percentage of sensory terms used to describe samples	CLT: 33.9[b] HUT: 35.7[a]	CLT: 27.4[a] HUT: 21.0[b]	CLT: 34.8[a] HUT: 28.9[b]
Sample differences			
Number of sensory terms with significant differences among samples (p ≤ 0.05)	CLT - RATA: 6 CLT – RATA-S: 8 HUT - RATA: 5 HUT – RATA-S: 4	CLT - RATA: 7 CLT – RATA-S: 8 HUT - RATA: 4 HUT – RATA-S: 5	CLT - RATA: 7 CLT – RATA-S: 9 HUT - RATA: 9 HUT – RATA-S: 10

RATA: indicates that the data were used based upon the frequency of selection; RATA-S: indicates that the data were analyzed by creating a summed index of the scores provided by all participants for each of the terms

[a,b] Term usage percentages with a different letter differ significantly between the scaling methods (P ≤ 0.05)

Effect of brand

Overall acceptance

Blind (B), expected (E) and informed (I) mean (S.D) liking scores of products evaluated under blind, expected (brand logo) and informed conditions by consumers (on a 9-point scale) at the CLT test (n = 53) and HUT (n = 46), together with differences between mean ratings for each sample

I–B denotes informed minus blind liking scores; E–B denotes expected minus blind liking scores; I–E denotes informed minus expected liking scores

Sample	B	E	I	E-B	I-B	I-E
CLT						
P1	5.1[c](1.9)	6.5[b](1.7)	5.9(1.5)	1.3***	0.8**	-0.5*
P2	5.8[b](1.6)	7.2[a](0.9)	6.0(1.4)	1.4***	0.2	-1.2***
PL1	5.5[bc](1.7)	5.6[c](1.1)	5.7(1.8)	0.1	0.2	0.1
PL2	6.5[a](1.4)	5.8[c](1.3)	6.1(1.5)	-0.7**	-0.3	0.4
PL3	5.8[b](1.5)	5.5[c](1.0)	5.8(1.5)	-0.3	0.0	0.3
HUT						
P1	5.7(1.6)	6.5[b](1.4)	5.2[c](1.7)	0.7*	-0.5	-1.2***
P2	6.0(1.5)	7.0[a](0.9)	6.3[a](1.4)	1.0***	0.3	-0.7**
PL1	5.4(2.1)	5.7[c](1.2)	6.0[ab](1.6)	0.2	0.6	0.4
PL2	5.9(1.7)	5.8[c](1.0)	5.5[bc](1.8)	-0.1	-0.4	-0.3
PL3	5.8(1.8)	5.6[c](1.0)	5.3[bc](1.5)	-0.2	-0.5	-0.03

[a,b,c] Products with the same letter code, within a column, are not significantly different (P ≤ 0.05) during the condition (blind / expected / informed).

*,**,***depicts significant differences between the liking scores at respectively P ≤ 0.05, P ≤ 0.01 and P ≤ 0.001.

Emotional profiling

Mean emotional ratings per product under the three conditions (B = blind, E = expected and I = informed) in the CLT (n = 53) and HUT (n = 46). Directions of significant main effects are indicated by arrows (P ≤ 0.05).

	CLT						HUT					
	B	E-B	E	I-E	I	I-B		B	E-B	E	I-E	I	I-B
P1							**P1**						
Disappointed	1.21[a]	↓	0.38[b]		0.66[ab]		**Disappointed**	0.37[ab]		0.07[b]	↑	0.98[a]	
Discontented	1.06[a]	↓	0.04[b]	↑	0.51[a]		**Dissatisfied**	0.43[a]	↓	0.00[b]	↑	0.74[a]	
Disgust	0.58[a]	↓	0.00[b]		0.26[ab]		**Pleasant**						
Friendly	0.19[b]	↑	1.09[a]		0.70[ab]		**surprised**	0.35[ab]		0.07[b]	↑	0.61[a]	
Steady	0.57[b]	↑	1.26[a]		0.93[ab]								
Unpleasant surprised	0.81[a]	↓	0.06[b]	↑	0.53[a]								
P2							**P2**						
Disappointed	0.70[a]	↓	0.09[b]	↑	0.58[a]		**Disappointed**	0.33[ab]		0.07[b]	↑	0.61[a]	
Good	0.85[b]	↑	2.08[a]	↓	0.87[b]								
Unpleasant surprised	0.40[ab]		0.04[b]	↑	0.66[a]								
PL1							**PL1**						
Bored	0.09[ab]		0.53[a]	↓	0.04[b]		**Disappointed**	1.02[a]	↓	0.22[b]		0.39[ab]	
Disappointed	0.89[a]	↓	0.23[b]		0.68[ab]		**Disgust**	0.52[a]	↓	0.00[b]		0.13[ab]	
Disgust	0.23[ab]		0.00[b]	↑	0.32[a]								
Unpleasant surprised	0.81[a]	↓	0.21[b]		0.43[ab]								
PL2							**PL2**						
Interested	0.70[a]	↓	0.17[b]		0.64[ab]		**Dissatisfied**	0.33[ab]		0.07[b]	↑	0.63[a]	
Pleasant	1.26[a]	↓	0.53[b]	↑	1.15[a]		**Disappointed**	0.74[a]	↓	0.15[b]	↑	0.91[a]	
Pleasant surprised	0.87[a]	↓	0.32[b]	↑	1.00[a]		**Pleasant surprised**	0.87[a]	↓	0.11[b]		0.37[ab]	
PL3							**PL3**						
Pleasant	0.92[a]		0.47[ab]		0.34[b]	↓	**Interested**	0.80[a]	↓	0.15[b]		0.24[ab]	
Pleasant surprised	0.43[b]		0.11[b]	↑	0.96[a]	↑	**Pleasant**	1.13[a]		0.41[ab]		0.30[b]	↓
							Pleasant surprised	0.98[a]	↓	0.20[b]		0.52[ab]	
							Satisfied	1.80[a]	↓	0.89[b]		0.76[b]	↓

[ab] Intensities with the same letter code, within a row for a specific setting (CLT / HUT), are not significantly different (P ≤ 0.05)

Sensory profiling

Mean sensory intensity ratings per product under the three conditions (B = blind, E = expected and I = informed) at the CLT (n = 53) and HUT (n = 46). Directions of significant main effects are indicated by arrows.

	CLT						HUT					
	B	E-B	E	I-E	I	I-B		B	E-B	E	I-E	I	I-B
P1							**P1**						
Liquid	0.98[a]	↓	0.36[b]		0.81[ab]		**Firm**	0.69[ab]		0.85[a]	↓	0.15[b]	
Sweet	1.68[a]	↓	1.00[b]		1.13[ab]		**Liquid**	1.35[a]	↓	0.52[b]		0.76[ab]	
							Off-flavor	0.72[a]	↓	0.11[b]		0.50[ab]	
							Sour	0.65[b]		0.70[b]	↑	2.1[a]	↑
P2							**P2**						
Aftertaste	0.81[a]	↓	0.13[b]	↑	0.58[a]		**Aftertaste**	1.00[a]	↓	0.04[b]		0.37[ab]	
Creamy	0.87[b]	↑	1.64[a]		1.40[ab]		**Homogeneous**	2.33[a]	↓	0.54[b]	↑	1.67[a]	
Homogeneous	1.87[ab]		1.21[b]	↑	2.25[a]		**Off-flavor**	1.07[a]	↓	0.00[b]		0.30[b]	↓
Fruity flavor	2.13[b]	↑	3.21[a]	↓	2.06[b]		**Smooth**	1.65[a]	↓	0.59[b]	↑	1.67[a]	
Liquid	1.23[a]	↓	0.45[b]		0.64[ab]		**Sour**	0.63[a]	↓	0.11[b]		0.30[ab]	
Milky flavor	0.64[ab]		0.21[b]	↑	1.11[a]		**Sweet**	1.74[a]		0.93[ab]		0.52[b]	↓
Smooth	1.58[ab]		0.79[b]	↑	1.75[a]								
Sour	0.60[a]	↓	0.15[b]	↑	0.62[a]								
PL1							**PL1**						
Aftertaste	0.85[a]	↓	0.28[b]		0.74[ab]		**Creamy**	1.67[a]	↓	0.39[b]	↑	1.61[a]	
Creamy	1.51[a]	↓	0.58[b]		1.28[ab]		**Smooth**	1.37[a]	↓	0.43[b]		0.72[ab]	
Fruity flavor	2.64[a]	↓	1.43[b]	↑	2.41[a]		**Sweet**	2.78[a]	↓	1.59[b]	↑	2.70[a]	
Liquid	0.83[ab]		1.19[a]	↓	0.34[b]		**Thick**	0.96[a]	↓	0.17[b]		0.54[ab]	
PL2							**PL2**						
Creamy	2.04[a]	↓	0.34[b]	↑	1.19[a]		**Creamy**	1.85[a]	↓	0.59[b]		1.26[ab]	
Dark color	0.06[b]		0.30[ab]		0.57[a]	↑	**Firm**	1.65[a]	↓	0.52[b]		0.46[b]	↓
Firm	1.36[a]	↓	0.51[b]		0.92[ab]		**Homogeneous**	1.02[a]		0.70[ab]		0.27[b]	↓
Liquid	0.23[b]	↑	1.34[a]	↓	0.34[b]		**Liquid**	0.22[b]	↓	1.11[a]		0.54[ab]	
Thick	1.55[a]	↓	0.30[b]	↑	0.96[a]		**Sweet**	2.91[a]	↓	1.30[b]	↑	2.33[a]	
							Thick	1.63[a]	↓	0.04[b]	↑	0.61[c]	↓
PL3							**PL3**						
Creamy	1.89[a]	↓	0.43[b]	↑	1.75[a]		**Aftertaste**	1.09[a]	↓	0.28[b]		0.67[ab]	
Firm	1.04[ab]		0.43[b]	↑	1.79[a]		**Creamy**	1.59[a]	↓	0.59[b]		1.11[ab]	
Liquid	0.55[ab]		1.19[a]	↓	0.26[b]		**Firm**	1.57[a]	↓	0.35[b]	↑	1.28[a]	
Sour	0.51[a]	↓	0.11[b]		0.51[ab]		**Fruity aroma**	1.65[a]		1.46[ab]		0.72[b]	↓
Thick	0.77[b]		0.53[b]	↑	1.66[a]	↑	**Liquid**	0.61[ab]		0.89[a]	↓	0.13[b]	
							Milky flavor	0.80[a]		0.22[b]	↑	1.37[a]	
							Thick	1.20[a]	↓	0.07[b]	↑	1.41[a]	

[abc] Intensities with the same letter code, within a row for a specific setting (CLT / HUT), are not significantly different (P ≤ 0.05)

Conclusions

- ✓ While emotional profiles of the products differed depending on the context, this was less the case for the sensory profiles
- ✓ Brand information clearly affected the sensory perception of certain attributes but had less influence on the overall liking and emotional profiling

These results suggest that both scientists and food companies should consider the impact of the chosen methodology (context and presentation of the stimuli) on the ecological validity when conducting sensory research with consumers.

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